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EXAMINER

WYSZOMIERSKI, GEORGE P

ART UNIT

PAPER NUMBER

1742

DATE MAILED: 06/20/2002

Handwritten signature/initials

Please find below and/or attached an Office communication concerning this application or proceeding.

Handwritten: 06/20/02

Office Action Summary

Application No.

09/821,723

Applicant(s)

HAMPDEN-SMITH ET AL.

Examiner

George P Wyszomierski

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-63 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 48-63 is/are allowed.
- 6) ☒ Claim(s) 1,3,4,7-41 and 43-47 is/are rejected.
- 7) ☒ Claim(s) 2,5,6 and 42 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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1. Claims 1-47 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The meaning of the term "material property" is unclear in context, i.e. other than specific material properties mentioned in the specification and claims, such as composition, it is unclear what property or properties would be required to be varied nor by what level in order for one to practice an invention within the scope of the claims. As a practical matter, the examiner notes that virtually any continuous chemical process inherently includes minor variations in reaction conditions during the time that the process is occurring (e.g. minor variations in temperature and rate of reaction), and it is uncertain to what degree these minor variations would/would not result in a process within the scope of the claimed invention.

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 3, 4, 7, 8, 13, 15-17, 19, 22, 31, 32, 36, 40, 41, 43, and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Mourer et al. (U.S. Patent 5,268,018).

The Mourer patent discloses an atomizing process in which a controlled spray of atomized droplets is achieved by selectively varying such parameters as temperature, flow rate of metal, and flow rate of atomizing gas. All such parameters are measured and analyzed, and the input values such as flow rate of gas are then adjusted in order to create certain desired

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properties in a final product. Thus, all aspects of the claimed invention are held to be fully met by the disclosure of Mourer et al.

4. Claims 1, 3, 4, 11, 13, 16, 19, 22, and 28-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Araya et al. (U.S Patent 4,610,718).

Araya discloses manufacturing ultrafine particles (i.e. with a size as recited in claims 28-30) of metals or alloys in a plasma arc furnace and including steps such as varying the amount of arc current at different points within the process (see Araya column 2, line 63 to column 3, line 34). Thus, the presently claimed process is held to be fully met by the Araya et al. disclosure.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 9-12, 14, 23, 33-35, 37-39, 45, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mourer et al.

The Mourer patent, described supra, does not specifically mention the limitations stated in the present claims. However,

a) With respect to claim 9, the starting materials of Mourer appear to be substantially dry, i.e. do not contain water.

b) With respect to claims 10-12 and 37-39, these claims are drawn entirely to apparatus limitations and such limitations cannot render an otherwise known process patentable.

c) With respect to claim 14, the claim merely recites heating which can occur at any time after the collecting step, i.e. after the reaction is complete, and the examiner's position is that numerous well known heating processes typically performed on metal particles, such as annealing or sintering, would fall within the limitations of this claim.

d) With respect to claim 23, the Mourer process is drawn to the production of metal particles in general, which would include solder particles.

e) With respect to claim 33, the Mourer process can measure and selectively vary the temperature, and to do so within the numerical limitations as claimed would fall within the purview of the Mourer patent.

f) With respect to instant claims 34 and 35, clearly any metal components may be chosen as starting materials to be atomized using the Mourer process, and such would include the components as recited in the instant claims.

g) With respect to claim 45, controlling the diameter of formed particles to a desired level is a key step to a successful atomization process; thus to measure the diameter as presently claimed would have been well within the level of one of ordinary skill in the art practicing the Mourer et al. process.

h) With respect to claim 46, claim 16 of Mourer suggest that the presently claimed limitation by incorporated into the prior art process.

Consequently, a prima facie case of obviousness is established between the disclosure of Mourer et al. and the presently claimed invention.

7. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Araya et al..

The Araya patent does not specify the production of solder particles, as required by the instant claim. However, Araya column 5, lines 10-14 indicate that the prior art process is applicable to the production of numerous metals and alloys, which would include the production of solder particles. Thus, to form solder particles as presently claimed would have been well within the level of one of ordinary skill in the art performing the Araya et al. process.

8. Claims 18, 20, 21, 24-27, 34, 35, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mourer et al. in view of Benoit et al. (U.S. Patent 6,087,003).

The Mourer patent, discussed supra, does not specify the materials as recited in instant claims 18, 20, 21, 24-27, or 47, nor does this reference disclose the use of volatile or gas phase precursors as required by instant claims 34 and 35. However,

a) With respect to making of "composite particles", "inorganic compounds", "electrocatalyst materials", or "phosphor compounds", the Mourer patent is drawn to the production of metal droplets in general, which would include the presently claimed categories of materials.

b) Benoit discloses that it is conventional in the art to produce materials such as organic or inorganic compounds or pharmaceutical materials by reacting precursors in such a manner that one portion of the material being produced clearly has different properties than another portion of the material; see Benoit column 6, lines 34-56.

c) Benoit further discloses that the original material in the prior art process may be gaseous (see Benoit column 6, line 29), and that these materials may be formed by a variety of techniques including spray drying or hot melt processing (Benoit column 6, line 67), i.e. by a process analogous to the Mourer process.

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Consequently, the combined disclosures of Mourer et al. and Benoit et al. would have taught the claimed invention to a person of ordinary skill in the art.

9. Claims 2, 5, 6, and 42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and claims 48-63 are allowable over the prior art of record. The prior art does not disclose or suggest processes of fabricating particulate materials having a distinct compositional variation therein.

10. The drawings in this application were declared informal by Applicant, and contain obviously informalities such as hand-drawn features and photocopies of photographs. Formal drawings are required in response to this Office Action. Applicant may no longer request that drawing corrections be held in abeyance; see 37 CFR 1.85(a).

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Wyszomierski whose telephone number is (703) 308-2531. The examiner can normally be reached on Monday thru Friday from 8:00 a.m. to 4:30 p.m. Eastern time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on (703) 308-1146. The fax phone number for this Group is (703) 872-9310. The Right fax number for this examiner is (703) 872-9039. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

GEORGE WYSZOMIERSKI
PRIMARY EXAMINER

GPW
June 17, 2002